

TITLE OF THE INVENTION

GAME APPARATUS AND RECORDING MEDIUM

BACKGROUND OF THE INVENTION

5 Field of the Invention

[0001] The present invention relates to a game apparatus which displays a game space. More particularly, the present invention relates to a game apparatus which displays an aiming point on a game screen, the aiming point being used when throwing an item
10 to be used in a game towards an object in the game space.

Description of the Background Art

[0002] Games are known, e.g., shooting games, in which an aiming point is displayed on a game screen. In such a game, a player
15 is able to take aim at an enemy character by aligning the aiming point displayed on the game screen with the enemy character. This makes it easier for the player to shoot the enemy character.

[0003] There is a class of shooting games which not only display an aiming point on a game screen but also change the displayed
20 mode of the aiming point depending on whether the aiming point is properly overlapping an enemy character or not (see Japanese Patent Laid-Open Publication No. 11-259686). This permits the player to know in advance whether a shot which he or she is going to make will actually hit the enemy character, and thus ensures
25 more successful shooting.

[0004] Another conventional technique is disclosed in Japanese Patent Laid-Open Publication No. 2000-84242.

[0005] In a shooting game of the above kind, where there is only one item (e.g., a gun) to be used by the player, there is no disadvantage in changing the displayed mode of the aiming point based solely on whether the aiming point is properly overlapping an enemy character or not. However, in a game which allows the player to select one of a plurality of items (e.g., a rope, a hook, and a boomerang) and throw the selected item at an object (e.g., an enemy character, a tree, etc.), such that different items will be effective on different objects, it may add to the confusion of the player if the displayed mode of the aiming point is changed based solely on whether the aiming point is overlapping an object or not.

[0006] More specifically, if the player has selected a rope (i.e., an item to be thrown at a branch of a tree which the player wishes to climb up) and the aiming point happens to overlap an enemy character which has suddenly emerged, the displayed mode of the aiming point will transition to that which indicates successful targeting. Then, surprised by the sudden appearance of the enemy character, the player may impulsively throw the rope at the enemy character based on the indication of successful targeting, before being able to change the item from the rope to a boomerang (i.e., an item to be thrown at an enemy character which the player wishes to attack). This might possibly invite

a disadvantageous situation.

SUMMARY OF THE INVENTION

[0007] Therefore, an object of the present invention is to
5 provide a game apparatus for realizing a game which allows the
player to select one of a plurality of items to be thrown at an
object, such that the player is allowed to recognize whether the
item will be effective on the object before throwing the item.

[0008] The present invention has the following features to
10 attain the object mentioned above. The reference numerals or the
like indicated between parentheses are merely provided to help
understanding the present invention in light of the embodiments
to be described later, and are not of any limitative nature.

[0009] A first aspect of the present invention is directed to
15 a game apparatus for displaying an aiming point on a game screen,
the aiming point being for use when an item to be used in a game
is thrown at an object in a game space, comprising: an object
deployment means (the CPU 201 executing step S102), an operation
means (50) to be operated by a player, a throwable item selection
20 means (the CPU 201 executing step S204), a target object specifying
means (the CPU 201 executing step S302), a correspondence
information storing means (205), a determination means (the CPU
201 executing step S303), and a display control means (the CPU
201 executing steps S103 and S109). The object deployment means
25 deploys in a three-dimensional space a plurality of objects to

be displayed, the plurality of objects including a player object. The throwable item selection means selects, in accordance with an operation made to the operation means, one of a plurality of items which are selectable by the player object as throwable items.

5 Note that a "throwable item" is not limited only to an item to be thrown at a target but also includes an item to be shot, e.g., from a gun. The target object specifying means specifies as a target object an object existing in a direction in which the throwable item is to be thrown. The correspondence information

10 storing means stores correspondence information (FIG. 7) defining which throwable item is effective on which object on an item-by-item basis. The determination means determines an effectiveness of the throwable item on the target object based on the correspondence information. The aiming point data generation means generates

15 aiming point data to be used for displaying an aiming point indicating the direction in which the throwable item is to be thrown, the aiming point being displayed in a display mode (a first or second aim object) which is varied depending on a determination result by the determination means. The display control means

20 performs display control so that the plurality of objects deployed by the object deployment means are displayed on the game screen as three-dimensional images; the aiming point is displayed so as to overlap the target object based on the aiming point data; and thereafter the throwable item appears thrown at the aiming point

25 in response to an operation made to the operation means. Thus,

the player is allowed to recognize whether the throwable item will be effective on the target object before actually throwing the item.

[0010] In a second aspect based on the first aspect, a
5 transparent object is placed (FIG. 22) in a neighborhood of at least one object (e.g., a tree) in the game space displayed on the game screen, the transparent object being visually unrecognizable to the player. The target object specifying means specifies as the target object one of the transparent objects that
10 is located in the direction in which the throwable item is to be thrown. The correspondence information storing means stores correspondence information (FIG. 24) defining which throwable item is effective on which transparent object on an item-by-item basis. Thus, it is possible to designate an arbitrary portion
15 which a throwable item will be effective on, regardless of the number of objects displayed on the game screen or the shape of the displayed objects.

[0011] In a third aspect based on the first aspect, the game apparatus further comprises positional relationship calculation
20 means (the CPU 201 executing step S305) for calculating a positional relationship between the player object and the target object. The determination means determines the effectiveness based on the correspondence information (S303) as well as an effective range (FIG. 7) which is defined for each item and a calculation result
25 by the positional relationship calculation means (S306). Thus,

before actually throwing the item, the player is allowed to recognize whether the target object is located in the effective range which is defined for each throwable item.

[0012] In a fourth aspect based on the third aspect, the
5 positional relationship calculation means calculates a distance from the player object to the target object, and the determination means determines the effectiveness based on the correspondence information as well as a shooting range which is defined for each item and the calculation result by the positional relationship
10 calculation means. Thus, before actually throwing the item, the player is allowed to recognize whether the target object is located in the shooting range which is defined for each throwable item.

[0013] In a fifth aspect based on the first aspect, the game apparatus further comprises a marking means (the CPU 201 executing
15 step S403) for marking the target object in response to an operation made to the operation means, granted that the determination means determines that the throwable item is effective on the target object. The display control means controls (S504, S505) a trajectory of the throwable item so that the throwable item hits the target object
20 as marked by the marking means. Thus, only the object which the throwable item will be effective on is locked-on, whereas any object which the throwable item will not be effective on is not locked-on, ensuring that the throwable item will hit the locked-on object without fail.

25 [0014] In a sixth aspect based on the fifth aspect, if a plurality

of target objects are marked by the marking means, the display control means controls (S505) the trajectory of the throwable item so that the throwable item hits all of the marked target objects. Thus, it can be ensured that the throwable item will hit a plurality of objects which the throwable item will be effective on, without fail.

[0015] These and other objects, features, aspects and advantages of the present invention will become more apparent from the following detailed description of the present invention when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] FIG. 1 is a general view showing a game system according to one embodiment of the present invention;

15 FIG. 2 is a block diagram illustrating an internal structure of a game processing apparatus 20;

FIG. 3 is a memory map of a main memory 205;

FIG. 4 is a partial detailed memory map of the main memory 205;

20 FIG. 5 is a partial detailed memory map of the main memory 205;

FIG. 6 is a partial detailed memory map of the main memory 205;

FIG. 7 is a table showing correspondence information;

25 FIG. 8 is a flowchart illustrating an overall flow of

the game processing performed by the game processing apparatus
20;

FIG. 9 is a detailed flowchart illustrating an item
selection process;

5 FIG. 10 is a detailed flowchart illustrating an aiming
point data generation process;

FIG. 11 is a detailed flowchart illustrating a marking
process;

10 FIG. 12 is a detailed flowchart illustrating an item
activation process;

FIG. 13 shows an exemplary game image in the case where
no object exists in the direction in which an item is to be thrown;

15 FIG. 14 shows an exemplary game image in the case where
an object exists in the direction in which an item is to be thrown,
such that the item will not be effective on the object;

FIG. 15 shows an exemplary game image in the case where
an object exists in the direction in which an item is to be thrown,
such that the item will be effective on the object but the object
is not within the shooting range of that item;

20 FIG. 16 shows an exemplary game image in the case where
an object exists in the direction in which an item is to be thrown,
such that the item will be effective on the object and the object
is within the shooting range of that item;

25 FIG. 17 shows an exemplary game image in the case where
an enemy A is marked;

FIG. 18 shows an exemplary game image in the case where a plurality of enemies are marked at the same time;

FIG. 19 shows an exemplary game image which results if the item is thrown in the state shown in FIG. 16;

5 FIG. 20 shows an exemplary game image which results if the item is thrown in the state shown in FIG. 17;

FIG. 21 shows an exemplary game image which results if the item is thrown in the state shown in FIG. 18;

10 FIG. 22 shows an exemplary game image in the case where a transparent object is deployed;

FIG. 23 is a partial detailed memory map of the main memory 205 in the case where a transparent object is deployed;

FIG. 24 is a table showing correspondence information in the case where a transparent object is deployed;

15 FIG. 25 shows an exemplary game image in the case where an object exists in the direction in which an item is to be thrown, such that the item will not be effective on the object; and

20 FIG. 26 shows an exemplary game image in the case where an object (a transparent object) exists in the direction in which an item is to be thrown, such that the item will be effective on the object.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0017] Hereinafter, an embodiment of the present invention will
25 be described with reference to the figures.

FIG. 1 is a general view showing a game system according to one embodiment of the present invention. In FIG. 1, a TV monitor 10 is coupled to the game processing apparatus 20, so that a game image which is generated by the game processing apparatus 20 is displayed on the screen of the TV monitor 10. A DVD 30 is mounted to the game processing apparatus 20. The DVD 30 stores a game program for causing the game processing apparatus 20 to execute game processing (described later), game data to be used for the game processing, and correspondence information (described later). A controller 50 to be operated by a player is coupled to the game processing apparatus 20. An external memory card 40 is mounted to the game processing apparatus 20 as necessary. The external memory card 40 is composed of non-volatile memory so as to be capable of storing the data which is generated during the game process as necessary.

[0018] Referring to FIG. 2, the internal structure of the game processing apparatus 20 will be described. The game processing apparatus 20 includes: a CPU 201 which performs game processing in accordance with the game program; a GPU 202 which performs an image generation process by utilizing a geometry unit and a rendering unit; a color buffer 203 and Z buffer 204 used for image processing; a main memory 205; a DSP 206 which is mainly in charge of audio processing and a sub-memory 207 to be used in conjunction therewith; a memory controller 208 for controlling the data transfer between different units; a controller I/F 209 for enabling

signal exchanges with the controller 50; a video I/F 210 for enabling
signal exchanges with the TV monitor 10; an external memory I/F
211 for enabling signal exchanges with the external memory card
40; an audio I/F 212 for enabling signal exchanges with a loudspeaker
5 60; a DVD drive 213 which writes or reads data on the DVD 30; and
a DVD disk I/F 214 for enabling data exchanges with the DVD 30.

[0019] Next, referring to FIGS. 3 to 7, a memory map of the
main memory 205 included in the game processing apparatus 20 will
be described. As shown in FIG. 3, the main memory 205 is provided

10 with: a game program storing area for storing the game program
which is read from the DVD 30; an object data storing area for
storing object data which is read from the DVD 30 and various data
concerning objects which are generated during the game processing;
and a correspondence information storing area for storing

15 correspondence information which is read from the DVD 30. The
object data storing area includes: an area 71 for storing data
concerning a player object controlled by the user; an area 72 for
storing data concerning enemy objects (e.g., monsters) and
geographical objects (e.g., trees); an area 73 for storing data
20 concerning aim objects, and an area for storing data concerning
marking object used in the marking process described later.
Hereinafter, these areas will be more specifically described.

[0020] As shown in FIG. 4, the area 71, which is used for storing
data concerning a player object, stores not only data used for
25 generating the player object (polygons, textures, etc.) but also

position data indicating a position of the player object, object data corresponding to items which can be selected by the player (e.g., a rope, a hook, and a boomerang), and throwable item flags assigned for respective items to indicate whether each item is
5 currently used by the player.

[0021] As shown in FIG. 5, the area 72, which is used for storing data concerning enemy objects and geographical objects, stores data concerning each object. For example, an area 74 in the area 72 may be allocated for storing data concerning a first object,
10 so as to store data used for generating the first object as well as position data concerning the first object.

[0022] As shown in FIG. 6, the area 73, which is used for storing data concerning aim objects, stores data used for generating an aim object as well as position concerning the aiming point, data
15 concerning a first aim object (i.e., an aiming point being displayed in the first display mode described later), and a second aim object (i.e., an aiming point being displayed in the second display mode described later).

[0023] The correspondence information storing area shown in
20 FIG. 3 stores correspondence information as shown in FIG. 7. In the illustrated correspondence information, for each item, a shooting range and an object(s) corresponding to that item are defined. For example, a "hook" item has a shooting range of "15", and a first object and a second object are defined as objects which
25 the hook item will be effective on. In other words, if either

the first object or the second object exists within a range of "15" (by arbitrary units) from where the player character is, it is possible to effectively use the hook item for this object (i.e., so as to hook onto the object). On the other hand, it is impossible to effectively use the hook item for any object which exists outside the range of "15" from where the player character is. As for a third object defined in the table shown in FIG. 7, the hook item cannot be effectively used even if the third object exists within the range of "15" from where the player character is.

10 [0024] Hereinafter, referring to the flowcharts shown in FIGS. 8 to 12, a flow of game processing which is to be performed by the CPU 201 of the game processing apparatus 20 in accordance with the game program will be described.

[0025] In FIG. 8, once game processing begins, an initialization process is performed (S101). Then, based on the game data stored in the DVD 30 or the main memory 205, the CPU 201 generates a game image by deploying the respective objects (the player object, enemy objects, and geographical objects) in the three-dimensional game space (S102). The game image data thus generated is output to the TV monitor 10 (S103).

[0026] Then, based on the game program and the game data stored in the DVD 30 or the main memory 205 as well as an input made via the controller 50, the CPU 201 moves the respective objects in the game space (i.e., the player object, enemy objects, geographical objects, item objects, aim object, marking objects,

and the like) (S104). At this time, the game space after the objects have been moved is generated, and the game image data thus generated is stored to the color buffer 203 of the game processing apparatus 20. Thereafter, as described later, an item selection process (S105), an aiming point data generation process (S106), a marking process (S107), and an item activation process (S108) are consecutively performed, and finally the game image data stored in the color buffer 203 is output to the TV monitor 10 (S109). Then it is determined whether the game has come to an end (S110).
10 If the game is to continue, control returns to step S104; if the game is over, the game processing is ended. Hereinafter, the processes of steps S105 to S108 will be specifically described.

[0027] Referring to FIG. 9, the item selection process of step S105 will be described. First, it is determined whether an item
15 selection button (which is a predetermined button provided on the controller 50) has been depressed (S201). If the item selection button has been depressed, an item selection screen for allowing the player to select a throwable item (i.e., an item for the player to use in the game) is displayed on the TV monitor 10 (S202);
20 specifically, game image data for the item selection screen is generated and output to the TV monitor 10. On the other hand, if the item selection button has not been depressed, the item selection process is ended.

[0028] After the item selection screen is displayed at step S202, it is determined whether a throwable item has been selected
25

(S203). If a throwable item has been selected, a throwable item flag corresponding to the selected item is turned on (S204), and the item selection process is ended. The determination as to whether a throwable item has been selected or not is made based on whether a predetermined button provided on the controller 50 (e.g., an ENTER button) has been depressed or not. On the other hand, if no throwable item has been selected at step S203, it is determined whether the item selection has been canceled or not (S205). If the item selection has been canceled, the item selection process is ended. If the item selection has not been canceled, control returns to step S202. The determination as to whether the item selection has been canceled or not is made based on whether a predetermined button provided on the controller (e.g., a cancel button) has been depressed or not. Thus, the item selection screen keeps being displayed on the TV monitor 10 until an item is selected by the player, or until the item selection is canceled.

[0029] Next, referring to FIG. 10, the aiming point data generation process of step S106 will be described. First, by referring to the throwable item flag corresponding to each item, it is determined which throwable item flag is currently on (S301). If none of the throwable item flags is currently on, the aiming point displaying process is ended. On the other hand, if any throwable item flag is on, it is then determined whether any object exists in the direction in which the throwable item is to be thrown (S302). As described later, an aiming point is displayed in the

direction in which the throwable item is to be thrown. The player can rely on the aiming point to freely control the direction in which to throw the throwable item, by using the controller 50. If no object exists in the direction in which the throwable item is to be thrown, a first aim object displaying process (i.e., a process of drawing a first aim object into the color buffer 203) is performed to display an aiming point in a first display mode in that direction (S304), and the aiming point displaying process is ended. An exemplary game image in this case is shown in FIG. 13.

10 In the example shown in FIG. 13, the aiming point is being displayed in the first display mode to allow the player to recognize that there is no use in throwing the rope in the indicated direction.

[0030] On the other hand, if step S302 finds any object existing in the direction in which the throwable item is to be thrown (hereinafter, such an object will be referred to as a "target object"), it is then determined whether the throwable item will be effective on the target object, by referring to the correspondence information shown in FIG. 7 (S203). If it is determined that the throwable item will not be effective on the target object, the aforementioned first aim object displaying process is performed (S304), and the aiming point displaying process is ended. An exemplary game image in this case is shown in FIG. 14. Note that it is assumed that the "first object" in the table shown in FIG. 7 corresponds to trees shown in FIG. 14.

25 Since a rope item will not be effective on an enemy A, the aiming

point is displayed in the first display mode so as to overlap the enemy A, thereby indicating the ineffectiveness of the rope item.

[0031] On the other hand, if step S303 finds that the throwable item will be effective on the target object, the distance from

5 the player object to the target object is calculated (S305).

Thereafter, by referring to the correspondence information shown in FIG. 7, it is determined whether the target object is located within the shooting range of the throwable item (S306). If it

is determined that the target object is located outside the shooting

10 range of the throwable item, the aforementioned first aim object

displaying process is performed (S304), and the aiming point

displaying process is ended. An exemplary game image in this case

is shown in FIG. 15. In the example shown in FIG. 15, the distance

from the player character to the tree is "13" (by arbitrary units),

15 and therefore is greater than the shooting range of the rope item,

i.e., "10". Since the rope will not reach the tree even if thrown,

the aiming point is displayed in the first display mode so as to

overlap the tree, thereby indicating the farness of the tree.

[0032] On the other hand, if step S306 finds that the target

20 object is located within the shooting range of the throwable item,

a second aim object displaying process (i.e., a process of drawing

a second aim object into the color buffer 203) is performed to

display an aiming point in a second display mode in the direction

in which the throwable item is to be thrown, so as to overlap the

25 target object (S307), and the aiming point displaying process is

ended. An exemplary game image in this case is shown in FIG. 16. In the example shown in FIG. 16, the distance from the player character to the tree is "8" (by arbitrary units), and therefore is greater than the shooting range of the rope item, i.e., "10".

5 Since the rope will reach the tree if thrown, the aiming point is displayed in the second display mode so as to overlap the tree, thereby indicating the nearness of the tree.

[0033] Next, referring to FIG. 11, the marking process of step S107 will be described. First, it is determined whether the second
10 aim object is being displayed on the game screen (S401). This determination may be made by, for example, checking whether step S307 was performed in the immediately preceding instance of the aiming point displaying process (S105). If step S401 finds that the second aim object is being displayed, it is then determined
15 whether the player has instructed marking (S401). As used herein, "marking" means locking-on a target object. Once a target is marked, i.e., locked-on, the aiming point will automatically follow that object thereafter. By throwing the throwable item after marking an object, it is ensured that the throwable item will hit the object
20 even if the object moves away immediately after the throwable item is thrown. If step S401 finds that a marking instruction has been given, a marking object displaying process (i.e., a process of drawing a marking object into the color buffer 203) is performed to display a mark in the neighborhood of the target object to indicate
25 that the target object has been marked (S403), and the marking

process is ended. Note that the mark thus displayed will be moved during the aforementioned moving process of step S102 in accordance with the movement of the marked object. The aiming point can still be displayed after an object is marked, and by overlaying the aiming point on another object for further marking, it is possible to simultaneously mark a plurality of objects. For example, after the enemy A is marked as shown in FIG. 17, the player may proceed to further mark an enemy B and an enemy C as shown in FIG. 18. On the other hand, if step S401 finds that a second aim object is not being displayed, or if step S402 finds that no marking instruction has been given, the marking process is ended.

[0034] Next, referring to FIG. 12, the item activation process of step S108 will be described. First, it is determined whether the player has depressed an item activation button provided on the controller 50 (S501). If the item activation button has not been depressed, the item activation process is ended. If the item activation button has been depressed, it is then determined whether any mark is being displayed, i.e., whether one or more marked objects exist or not (S502). If no marks are being displayed, the trajectory of the throwable item is controlled so that the throwable item appears thrown in the direction indicated by the aiming point (S506), and the item activation process is ended. Thus, the throwable item is thrown in the direction indicated by the aiming point. An exemplary game image in this case is shown in FIG. 19. The example shown in FIG. 19 illustrates a result of throwing the

item in the state shown in FIG. 16.

[0035] On the other hand, if step S502 finds that any mark is being displayed, it is then determined whether a plurality of objects are being concurrently marked (S503). If only one object
5 is being marked, the action of the throwable item is controlled so that the throwable item will hit that object (S505), and the item activation process is ended. As a result, the throwable item appears thrown at the marked object. An exemplary game image in this case is shown in FIG. 20. The example shown in FIG. 20
10 illustrates a result of throwing the item in the state shown in FIG. 17, where a special effect (indicating a hit) is being applied to the object which has been hit by the throwable item.

[0036] On the other hand, if step S503 finds that a plurality of objects are being concurrently marked, the action of the
15 throwable item is controlled so that the throwable item will hit these objects (S504), and the item activation process is ended. As a result, the throwable item appears thrown at the marked objects. An exemplary game image in this case is shown in FIG. 21. The example shown in FIG. 21 illustrates a result of throwing the item
20 in the state shown in FIG. 18, where a special effect (indicating a hit) is being applied to the objects which have been hit by the throwable item.

[0037] The above embodiment illustrates an example where the display mode of the aiming point is changed based on the
25 effectiveness of a throwable item as determined with respect to

an object (e.g., a tree or an enemy) which is displayed on the game screen. In other embodiments, it may be desirable to assign a throwable item so as to be effective only on a portion of an object which is displayed on the game screen. For example, a rope
5 item may be made effective on a "branch" of a tree, but not on other portions (e.g., the root, trunk, or leaves) of the tree. This can be easily realized by employing a transparent object which cannot be visually recognized by the player. Hereinafter, this technique will be described with reference to FIG. 22 to FIG. 26.

10 [0038] First, a transparent object is placed on a predetermined portion of an object which is displayed on the game screen (this portion defines a portion which a specific item will be effective on). For example, a transparent object may be placed on a branch of a tree as shown in FIG. 22. The shape of the transparent object
15 may be spherical as shown in FIG. 22, or may be any other shape. The data concerning the transparent object may be stored, for example, in association with the object on which the transparent object is placed, as shown in FIG. 23. In the example shown in FIG. 22, trees correspond to the "first object" in the table shown
20 in FIG. 23, and the transparent object corresponds to the "first transparent object" in the table shown in FIG. 23. Furthermore, the correspondence between items and transparent objects is defined in the form of correspondence information as shown in FIG. 24. By performing processes similar to those described above on the
25 basis of this correspondence information, it can be ensured that

each throwable item will be effective on only a portion of an object displayed on the game screen. Specifically, in the example shown in FIG. 25, the object (tree) which exists in the direction in which a rope is to be thrown is not an object which the rope will be effective on, and therefore the aiming point is displayed in the first display mode. On the other hand, in the example shown in FIG. 26, a first transparent object exists in the direction in which the rope is to be thrown, and the rope will be effective on the first transparent object. Therefore, the aiming point is displayed in the second display mode.

[0039] Thus, by employing a transparent object, it is possible to arbitrarily designate a specific portion which an item will be effective on, regardless of the shape of the object displayed on the game screen. It will be appreciated that a plurality of transparent objects may be placed on a single object displayed on the game screen.

[0040] As described above, according to the present embodiment, the effectiveness of a throwable item on an object which is located in the direction in which the throwable item is to be thrown is determined based on correspondence information defining which item will be effective on which object on an item-by-item basis, and an aiming point is displayed in different display modes depending on the result of the determination. As a result, the player is allowed to recognize whether the throwable item will be effective on the object before actually throwing the item.

[0041] Although the present embodiment illustrates an example where the first display mode and the second display mode of an aiming point is distinguishable by its shape, the present invention is not limited thereto. The display mode of the aiming point may
5 be varied in any other manner, e.g., based on color differences or differences in flickering frequency, so long as the first display mode can be distinguished from the second display mode.

[0042] Although the present embodiment illustrates an example where an aiming point is displayed by appropriately updating the
10 game image data which has once been written to the color buffer 203, the present invention is not limited thereto. For example, the aim object may be placed in the game space, and an aiming point may be displayed by applying rendering to the aim object.

[0043] Although the present embodiment illustrates an example
15 where the effectiveness of a throwable item on a target object is determined based on a shooting range of the throwable item, the effective range of each item may be set in any arbitrary manner other than a shooting range. For example, the effective range of a boomerang item may be set to be any region lying above the
20 player object.

[0044] Although the present embodiment illustrates an application to throwable items, e.g., a rope, a hook, or a boomerang, the present invention is also applicable to items to be shot, e.g., from a gun.

25 [0045] While the invention has been described in detail, the

foregoing description is in all aspects illustrative and not restrictive. It is understood that numerous other modifications and variations can be devised without departing from the scope of the invention.